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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/098,730 06/18/98 SUGIYAMA

T PM-254782

EXAMINER

IMS2/0609

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ART UNIT

PAPER NUMBER

1744

DATE MAILED:

06/09/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

## Office Action Summary

Application No.

09/098,730

Applicant(s)

SUGIYAMA ETAL

Examiner

T. TUNG

Group Art Unit

1744

Paper No. 5

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

### Status

- ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

### Disposition of Claims

- ☒ Claim(s) 1-5 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-5 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement.

### Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

\*Certified copies not received: \_\_\_\_\_.

### Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 4
- ☐ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other \_\_\_\_\_

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Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "heterogeneous" (e.g. claim 1, line 4) is vague. Does it mean that the boundary layer has more than one component, or does it mean that the boundary layer is different from the other layers?

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Mase et al '126.

Mase '126 discloses a plurality of substrate layers including at least one of solid electrolyte. A boundary layer 12, 31 made of alumina or other ceramic materials is interposed between solid electrolyte layer 4 and insulating layer 8 and can have a thickness of 30 microns. Since the boundary layer is porous to minimize thermal stress and its neighboring layers are not, the boundary layer clearly is more porous than its neighbors. See col. 3, line 25 to col. 4, line 9 and col. 5, lines 17-25. As for the term "heterogeneous" to describe the boundary layer, it is noted that layer 12, 31 of Mase '126 is made from a paste (col. 4, line 10 and col. 5, lines 17-25), which has more than one component.

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Claims 1, 2, 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Mase '274.

Mase '274 discloses a plurality of substrate layers including at least one of solid electrolyte. A boundary layer 10 made of alumina or spinel as a major component is interposed between two substrate layers. Since there is at least one minor component, the boundary layer is heretogeneous. The boundary layer can have a thickness of 5-200 microns and is porous for minimizing thermal stress. See col. 5, line 66 to col. 6, line 43.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mase etal '126 or Mase etal '274 alone, or in view of Suzuki etal.

This claim differs by calling for the boundary layer to have a sintering particle diameter larger than those of its neighboring layers.

In as much as each Mase discloses the boundary layer to be more porous than its neighboring layers, one obvious way to ensure its higher porosity is to start with larger sintering particles.

In any event, Suzuki discloses forming a more porous layer by starting with larger particles than a neighboring layer. See col. 2, lines 38-49. It would have been obvious for either Mase to start with larger particles in order to obtain a more porous layer in view of Suzuki, since

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the adoption of known features from analogous prior art in the absence of unexpected result is within the skill of the art.

Togawa et al discloses an alpha alumina layer in a solid electrolyte. See the abstract. Mase et al '513 discloses a boundary layer 36 made of alumina. See column 8, lines 11-21.

The examiner can be reached at 703-308-3329. His supervisor Robert Warden can be reached at 703-308-2920. Any inquiry of a general nature should be directed to the receptionist at 703-308-0661.



Ta Tung

Primary Examiner

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